Advanced Econometrics (26:223:655:01)   **Spring 2008**

Meets Tuesdays, 2:30-5:20 PM**,** GFMC (Ackerson Hall 106)

Professor Robert H. Patrick

Office: 312 Ackerson Hall

Office Hours: Newark, Tuesdays 5:30-6:30PM,
            New Brunswick, Wednesdays 5:30-6:30PM (Levin 217C, Livingston Campus),
            and by appointment

Phone: 973-353-5247 (Newark), 732-445-5266 (New Brunswick).

e-mail: rpatrick@andromeda.rutgers.edu (Include AE at beginning of subject line please).

web: http://www.rci.rutgers.edu/~rpatrick/hp.html

This course is a continuation and generalization of the material covered in *Econometrics* (26:223:554). The purpose of this course is to develop advanced econometric estimation and hypothesis testing tools to analyze and interpret the empirical relevance of financial and other economic data. Unification of statistics, economic theory, and mathematics constitutes econometrics. Statistics, economic theory, and mathematics are a necessary, but not singly a sufficient, condition for a real understanding of the quantitative relations in modern economic life. In this course students will develop advanced econometric tools and strategies for their use in empirical finance and economics research. In particular, the course will provide students with a working knowledge of asymptotic statistical methods and the application of these statistical concepts to study large-sample properties of estimators (defined as the solution to an optimization problem, under various assumptions regarding the true data generating process). These large sample results will be applied to linear and nonlinear in parameters generalized least squares (GLS) and maximum likelihood (ML) estimators. These results are extended to develop a nonlinear instrumental variables estimator, the generalized method of moments (GMM) and various asymptotic testing procedures are derived for this general modeling framework. Panel data, simultaneous equations, time-series, discrete dependent, limited dependent and duration models and their application are covered.

References:

(G) William H. Greene, *Econometric Analysis,* 6th Edition, New Jersey: Prentice Hall, 2008.

(CT) A. Colin Cameron and Pravin K. Trivedi, *Microeconometrics: Methods and Applications*, Cambridge University Press, 2005.

(E) Walter Enders, *Applied Econometric Time Series*, 2nd Edition, John Wiley and Sons, Inc., 2004.

(CLM) John Campbell, Andrew Lo, and A. Craig MacKinlay, *The Econometrics of Financial*

Markets, Princeton University Press, 1997.

(HBE) *Handbook of Econometrics* Volumes I-V, North-Holland, various years.

(HBAE) *Handbook of Applied Econometrics* Volumes I and II, Basil-Blackwell, various years.

G, CT, and E will serve well for introductory and background material for the topics listed below. HBE and HBAE survey various topics and provide references to further literature. Other econometrics and related empirical articles from the economics and finance literature will be assigned, as well as selected material from the books listed as references. Students are encouraged to seek out whatever other reference material facilitates their learning of each topic.

Topics
1   Introduction and overview
2   Nonlinear Regression Models
3   GLS, FGLS, and ML
4   QML and GMM
5   Panel Data
6   Systems of Regression Equations
7   Simultaneous Equations Models
8   Estimation Frameworks, Estimators
9   Lagged Variables and Time-Series Models
10   Time-Series Models
11   Models with Discrete Dependent Variables
12   Limited Dependent Variable and Duration Models
13   Review, further applications
14   Final Exam

Other topics, depending on class interests, may be added as time permits.

You will be required to carry out econometric computations using data with assigned problems. No particular econometrics software package is required, you are free choose any that allow you to carry out the required computations. (Note that you may be asked to defend the accuracy of your chosen software.) Examples used in class will primarily be computed using LIMDEP (NLOGIT), SAS, or Mathematica.

You are responsible for all problems and problem sets assigned in class, which you may be asked to demonstrate in class or may be randomly collected and graded. Presentations, class participation, quizzes and graded problems will comprise 50% of your grade, and the final exam 50%.